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| 10/059,421 | 01/31/2002 | Tetsuo Shibuya | YOR920010126US2 | 6845 |

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| EXAMINER | |
|---|---|
| LY, CHEYNE D | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2168 | |

DATE MAILED: 06/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/059,421 | SHIBUYA ET AL. | |
| | Examiner | Art Unit | |
| | Cheyne D. Ly | 2168 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *April 05, 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,13-23 and 25-30* is/are rejected.

7)☒ Claim(s) *12 and 24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

1. Applicants' arguments filed April 05, 2006 have been fully considered but they are not deemed to be persuasive. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

2. On page 9, Applicant presents arguments directed to the withdrawal of claim 30. It is noted that the Examine had inadvertently not re-iterated the basis for said withdrawal from the Office Action, mailed July 25, 2005. However, Applicant has deleted limitations which causes claim 30 to be distinct from the examined claimed invention, as originally filed. Therefore, Applicant's argument directed to the withdrawal claim 30 is moot because of the claim amendment to claim 30.

3. Claims 1-30 are examined on the merits.

## CLAIM REJECTIONS - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-8, 10, 11, 13-23, 25, and 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Rigoutsos et al. (1999) (Rigoutsos hereafter).

6. This rejection is maintained with respect to claims 1-8, 10, 11, 13-23, 25, and 27-29, as recited in the previous office action mailed January 04, 2006.

7. It is noted that Rigoutsos et al. (1998) has been cited to describe the inherent characteristics of the Teiresias algorithm.

8. In regard to claim 1, Rigoutsos describes a system comprising:

   a. A pattern database comprising patterns of amino acids (page 225, column 2, The Database section);

   b. An input device for inputting a genomic DNA sequence (Abstract, lines 1-7, and page 226, lines 1-4);

   c. A processor which:

      i. Translates an open reading frame (ORF) of said DNA sequence into an amino acid translation (page 224, column 1, lines 6-40); and

      ii. Locates in said amino acid translation occurrences of said patterns from said pattern database to determine whether said open reading frame includes a putative gene is said DNA sequence (page 228, column 2, lines 4-11). It is noted that the instant specification does not specifically define the limitation of "putative gene." Therefore, the disclosure of the ten ORFs two ORFs has been identified as Fe-S oxidoreductases have been interpreted as the identification of putative genes from disclose genome sequences (DNA).D

9. It is noted that Rigoutsos does not explicitly describe the limitation of "translates an open reading frame." However, Rigoutsos does describe the input being ORFs from genomic sequences (page 225, column 2, lines 32-34) and Teiresias is implemented in a database comprising the amino acid sequences for the ORFs (page 225, column 2, The Database

section). Therefore, the disclosure supports that the ORFs from the genomic sequences are translated to amino acids sequences.

10. In regard to claim 2, Rigoutsos describes wherein said processor translates a plurality of open reading frames in said DNA sequence into amino acid translations, and locates in each amino acid translations occurrences of said patterns to determine whether each said plurality of open reading frames includes a putative gene (page 228, column 2, lines 4-11).

11. In regard to claim 3, Rigoutsos describes patterns comprise biologically significant patterns of amino acid sequences (page 225, column The Database section).

12. In regard to claim 4, Rigoutsos describes processor identifies a match of a pattern from said pattern database in said amino acid translation (page 226, column 2, lines 4-14, page 228, column 2, lines 4-15, and Figure 8).

13. In regard to claim 5, Rigoutsos describes patterns are derived from a parent database comprising at least one amino acid sequence (page 224, column 1, lines 36-39).

14. In regard to claim 6, Rigoutsos describes patterns are derived from a parent database comprising at least one amino acid sequence fragment (page 224, column 1, lines 36-39, and page 225, column 2, The Database section).

15. In regard to claim 7, Rigoutsos describes patterns are derived by using a pattern discovery algorithm (page 225, column 2, The Database section).

16. In regard to claim 8, Rigoutsos describes patterns are derived by using the Teiresias algorithm (page 225, column 2, The Database section).

17. In regard to claim 10, Rigoutsos describes processor reports said ORF as a putative gene when a predetermined number of pattern matches is identified in said amino acid translation

(page 225, columns 1-2, 1D Dictionary / Selecting The Various Parameters section, and page 228, column 2, lines 4-16).

18. In regard to claim 11, Rigoutsos describes each pattern is assigned a weight depending upon a relevance of said pattern in determining whether said ORF comprises a putative gene (page 224, column 2, lines 23-31, and page 226, column 2, lines 4-14).

19. In regard to claim 13, Rigoutsos describes match is identified using a predetermined pattern matching algorithm (page 226, column 2, lines 4-14, page 228, column 2, lines 4-15, and Figure 8).

20. In regard to claim 14, Rigoutsos describes a memory device for storing and instructions to be executed by said processor (page 223, column 2, lines 10-22). It is noted that Rigoutsos et al. (1998) describes processing the input set with TEIRESIAS required only a few seconds on an IBM Power-PC workstation (page 60, lines 1-3).

21. In regard to claim 15, Rigoutsos describes a display device for displaying an output from said processor (page 223, column 2, lines 10-22, and Figures 8 an 9). It is noted that Rigoutsos et al. (1998) describes processing the input set with TEIRESIAS required only a few seconds on an IBM Power-PC workstation (page 60, lines 1-3).

22. In regard to claims 16-23, 25, and 27-29, the citation of Rigoutsos above describes a method for using the system comprising the Teiresias algorithm, which anticipates the claimed invention as required by claims 16-23, 25, and 27-29.

**RESPONSE TO ARGUMENTS**

23. On page 11, last paragraph, Applicant's argument that "neither Rigoutsos nor Delcher...teaches or suggests an input device for inputting an genomic DNA sequence" is

not persuasive. It is noted that the limitation of "an input device for inputting an genomic DNA sequence" has been interpreted an intended for the claimed input device. As cited the Office Action, mailed January 04, 2006, Rigoutsos (1999) discloses "[t]hese motifs which refer to as seglets account for and cover 97.88 of the **genomic input** at the level of amino acid positions" (page 223, Abstract etc.). It is noted the pointed disclosure recites "at the level of amino acid positions", which Applicant argues during the interview, June 14, 2006, that said disclosure limits the input of Rigoutsos to amino acids. Applicant's argument is not persuasive because one of ordinary skill in the art at the time of the instant invention would have attributed the ordinary and customary definition of biological information that is made up of DNA, or RNA in a few viruses to the term **genomic**. Further, Rigoutsos (1999) discloses "we are making the assumption that the only available information is the annotation as it existed the day that the respective genome was submitted to GenBank" (page 228, column 1, 2nd to last paragraph). The citation above reasonably supports that the genomic input of Rigoutsos (1999) includes genomic DNA, as required by the claimed invention.

24. Further, the limitation of "for inputting an genomic DNA sequence"" has been reasonably construed as an intended use limitation. A statement of intended use in a method claim, wherein the steps in the method does not recite any limitation that would cause a manipulative difference, does not distinguish the claimed invention over the prior art method. (MPEP 2111.02 [R-2]). It is noted the intended use limitation is recited in the body of the claim, however, when the method, as a whole, does not recite any limitation that would cause a manipulative difference. Then, said intended use limitation does not distinguish the claimed invention over the prior art method.

25. On page 12, first paragraph, Applicant argues "neither Rigoutsos nor Delcher...teaches or suggests...a processor which: translates an open reading frame (ORF) of said DNA sequence into an amino acid translation; and locates in said amino acid translation occurrences of said patterns from said pattern database to determine whether said open reading frame includes a putative gene in said DNA sequence" is not persuasive as discussed below.

26. Specific to the limitation of "a processor", Rigoutsos (1999) describes via Rigoutsos (1998) "the processing the input set with TEIRESIAS required only a few seconds on an IBM Power-PC workstation" (Rigoutsos (1998), page 60, column 1, lines 1-2). It is noted that Rigoutsos et al. (1998) has been cited to describe that the method of Rigoutsos (1999) inherently supports that said is implemented with a processor.

27. In regard to the limitation of "translates an open reading frame (ORF) of said DNA sequence into an amino acid translation", Rigoutsos (1999) discloses "a database containing the ORFs for the complete genomes of 13 bacteria..." (page 224, column 1, lines 6-40). Specific to Rigoutsos (1999) disclosure of "ORFs," one of ordinary skill in the art would have attributed the ordinary and customary definition of DNA sequences that code for proteins comprise open reading frames (ORFs) consisting of a series of codons that specify the amino acid sequence of the protein. It is well known in the art ORFs are determined by searching a DNA sequence for ORFs that begin with an ATG and end with a termination triplet is therefore one way of looking for genes. Further, Applicant's disclosure on page 12, last paragraph supports that in order to determine ORFs, the open reading frames are determined in the DNA sequence. The disclosure contradicts Applicant's assertion during

the interview, June 14, 2006, that the ORFs disclosed by Rigoutsos (1999) are limited to the amino acids.

28. Specific to the limitation of "translates...", Rigoutsos (1999) discloses "the input to Teiresias comprises the ORFs from the 17 complete and publicly available genomes...Escherichia coli with 1358990 a.a....ORFs with a grand total of 10,316,873 amino acids. Our input database and annotations were composed of the contents of NCBI's Web-site of complete genomes (page 225, column 2, The Database section, to page 226, column 1, line 4). As supported by the instant disclosure on page 12, the ORFs of Rigoutsos (1999) are inherently translated to obtain the grand total of 10,316,873 amino acids.

29. Specific to the limitation of "locates in said amino translation occurrences of said patterns from pattern database to determine whether said open reading frame includes a putative gene in said DNA sequence", Rigoutsos discloses said limitation as cited above. For example, Applicant discloses (page 19, lines 5-6) "ORFs which were reported as putative genes overlap with regions that have been designated as coding in the public databases." Therefore, Rigoutsos' disclosure of "the seqlets that are discovered when we process the input database...are annotated as Fe-S oxidoreductases", as supported the sequence alignment (overlap) for the sequences (page 228, column 2, lines 4-11), is consistent with the disclosure of locating putative genes by the instant specification.

## CLAIM REJECTIONS - 35 USC § 103

30. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

31. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

32. Claims 9, 26, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rigoutsos et al. (1999) (Rigoutsos hereafter) as applied to claims 1-8, 10, 11, 13-23, 25, and 27-29 above, and further in view of Delcher et al. (1999) (Delcher hereafter).

33. This rejection is maintained with respect to claims 1-11, 13-23, and 25-29, as recited in the previous office action mailed January 04, 2006. Further, the instant rejection has been extended to claim 30 as necessitated by claim amendments.

34. Rigoutsos describes the invention as required by claims 1-8, 10, 11, 13-23, 25, and 27-29.

35. Specific to the limitation of "a display device..." of claim 30, Rigoutsos describes the claimed display device in Figures 8 and 9.

36. However, Rigoutsos does not describe the limitation of "ORF comprises a portion of said DNA sequence between a start codon and a stop codon" as required by claims 9, 26, and 30.

37. Delcher describes an improvement to make GLIMMER more accurate for gene identification (Abstract etc., page 4639, column 2, last two lines). Therefore, one of ordinary skill in the art at the time of the instant invention would have been motivated by Delcher to improve the accuracy of GLIMMER by using the system described by Rigoutsos for specificity and sensitivity (Rigoutsos, page 224, column 2, last paragraph) for greater accuracy.

38. In regard to claims 9, 26, and 30, Delcher describes ORF comprises a portion of said DNA sequence between a start codon and a stop codon (page 4640 column 2, Table 5).

39. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to use the system as described by Rigoutsos and Delcher to improve accuracy.

40. It is noted that lines 8-9 of claim 26 recites optional limitation of "a sum...exceed a predetermined threshold" which has not been cited in either Rigoutsos or Delcher. Due to said being optional, the citation of said optional limitation is not required for the instant prior art rejection, because Rigoutsos and Delcher have been cited to describe the alternative limitation of "a predetermined number of matches is identified in said amino acid translation."

**RESPONSE TO ARGUMENTS**

41. On page 11, Applicant's argument that "these references would not have been combined as suggested by the Examiner...these references are unrelated..." is not persuasive. Delcher describes an improvement to make GLIMMER more accurate for gene identification (Abstract etc., page 4639, column 2, last two lines). Therefore, one of ordinary skill in the

art at the time of the instant invention would have been motivated by Delcher to improve the accuracy of GLIMMER by using the system described by Rigoutsos for specificity and sensitivity (Rigoutsos, page 224, column 2, last paragraph) for greater accuracy. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to use the system as described by Rigoutsos and Delcher to improve accuracy.

42. Specific to the arguments on page 13-14, it is noted that claims are given their broadest reasonable interpretation consistent with the specification. However, the instant claims are not limited to the argued limitations that have been cited by Applicant as limitations as not being disclosed by the cited references. As cited by the MPEP, the court explained that "reading a claim in light of the specification, to thereby interpret limitations explicitly recited in the claim, is a quite different thing from reading limitations of the specification into a claim,' to thereby narrow the scope of the claim by implicitly adding disclosed limitations which have no express basis in the claim." The court found that applicant was advocating the latter, i.e., the impermissible importation of subject matter from the specification into the claim.). See also In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997) (MPEP §2111 [R-1]).

43. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

## CONCLUSION

44. Claims 12 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

45. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

46. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

47. Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the

specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

48. For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199. The USPTO's official fax number is 571-272-8300.

49. Any inquiry concerning this communication or earlier communications from the examiner should be directed to C. Dune Ly, whose telephone number is (571) 272-0716. The examiner can normally be reached on Monday-Friday from 8 A.M. to 4 P.M.

50. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Vo, can be reached on (571) 272-3642.

C. Dune Ly / CDL
Patent Examiner
6/20/06

TIM VO
PRIMARY EXAMINER